

## Food safety and food-borne illness approach of healthcare workers

İrem Özyay<sup>1</sup>, Bedia Ayhan Özyıldırım<sup>2</sup><sup>1</sup> Lecturer of Haliç University, Department of Nutrition and Dietetics, İmrahor Street, No: 82, Beyoğlu district, İstanbul, TURKEY.<sup>2</sup> Professor of İstanbul University, Faculty of Medicine, Department of Public Health, Çapa district, 34093, İstanbul, TURKEY.[iremozay@gmail.com](mailto:iremozay@gmail.com), [bayhan@istanbul.edu.tr](mailto:bayhan@istanbul.edu.tr)

### ABSTRACT:

Each year, foodborne diseases cause significant health problems in millions of people all over the world. Because of this, in recent years food safety has become a subject of growing importance due to its public health and economical dimensions. In the light of these facts, our study was conducted in İstanbul among 107 healthcare workers (doctors, nurses and midwives) who work in Primary Healthcare Centers. Socio-demographic characteristics, knowledge about food safety, food-borne diseases and food-handling practices of participants were determined through face to face questionnaires. When food preferences of participants are considered, we see that the most important factor in purchasing decisions are appearance and freshness. It's found that doctors pay low attention to expiry dates than nurses and midwives ( $p < 0.05$ ). 91.6% of participants think that main problem that may be caused by foods is allergies. All participants agree on the opinion that expired products would cause food poisoning. 30.8% of participants don't know temperatures of refrigerators and freezers. It's found that the information which cross-contamination leads to food-borne illnesses is missing. Increasing the knowledge of consumers should be the main target in the prevention of foodborne illness. In this regard, community education programs should be prepared by healthcare workers. Therefore, priority should be set to raise the knowledge of healthcare workers and extensive research should be made to determine which issues to focus on. Also, tools like television-radio programs, social media, magazines-newspapers should be used to share the information of current approaches about food safety with public.

**Key Words:** Consumer attitudes, food safety, food-borne diseases, food-borne illness, public health.

### INTRODUCTION

Food safety is of crucial importance to the consumer, health sector, food industry and economy. Some substances in food such as impermissible levels of microbiological hazards, biotoxins, chemical contaminants, mycotoxins and food additives can be harmful to human health. With the developments in technology, consumers are also concerned about the safe food production techniques and processes (6). Due to a number of food-related incidents and reported outbreaks worldwide, consumer confidence has begun to vacillate (14). The three key elements of a healthy diet are; food security, food safety and healthy nutrition. Food security represents "continuous and adequate food supply for all people", food safety represents "healthy food supply" and healthy consumption represents "healthy nutrition". Healthy food supply, in other words, ensuring foods to be physically, chemically and microbiologically clean, is one of the common goals of WHO (World Health Organization) and FAO (Food and Agriculture Organization) (8).

Due to the lack of food safety, food-borne illnesses, deaths and economic losses occur. In developed countries, many cases of food-borne illness have been characterized as gastroenteritis and considered as benign condition. There may be exceptions among very young or very old, pregnant, sick or weak people. These vulnerable groups are an important part of the population and a diarrheal disease can be fatal for them (5). In developing countries, food-borne illnesses pose particularly

during infancy and childhood, seen with diarrhea and become a foremost health issue (11). Food-borne illnesses, which is seen with diarrhea and become a foremost health issue, occur particularly during infancy and childhood especially in developing countries.

The results of consumer studies concerning food safety knowledge and practices have shown that consumers are aware of food safety, although there are also many gaps in food safety knowledge and practices that may result in food-borne illnesses (14). To increase the level of knowledge related to food safety and to minimize food-borne outbreaks, training should be an integral component of all interventions. Therefore, building a successful intervention plan is of great importance to obtain information regarding food safety knowledge (22). Doctors' or experts' advices are the most trusted by the consumers, hence, can be used more effectively in training consumers (2, 6). Especially primary healthcare service professionals should play an important role on training consumers about food safety and safe food handling practices because of their close contact with the community. Hence, we carried out this study with primary healthcare professionals to determine their actual level of food safety knowledge. It is of vital importance to properly train healthcare professionals in order to inform the general public about food safety principles.

of 13 Primary Health Care Services in Beylikdüzü district. 107 out of 117 individuals have agreed to participate in the study. Data were collected by using a face-to-face conversation questionnaire. The questionnaire was created by modification of some

### MATERIAL AND METHOD

#### Survey design

The study was carried out with doctors, nurses and midwives, working in the province of Istanbul total

similar studies previously made (6, 14, 16). Questionnaire was designed to obtain information on demographics of respondents, food safety perceptions, and awareness of food-borne illnesses, contaminants of foods and hazards, confidence in food safety authorities, food handling and safety practices at home.

#### *Pilot survey*

The questionnaire was pilot tested on randomly selected 6 healthcare professionals working in a Primary Healthcare Service in Beylikdüzü district to ensure the clarity and validity of the study. It observed that the implementation results of the pilot survey is feasible. Hence, the pilot study has demonstrated that the survey design can be used for the major study.

#### *Data analysis*

The questionnaire responses were analyzed using SPSS version 16.0 software. Percentages of responses in each category were calculated and presented in tabular form. To examine the relationship among and between the variables, cross-tabulations and the chi-square test were used.  $p < 0.05$  was considered as significance level.

## **RESULTS AND DISCUSSION**

#### *Profile of respondents*

A total of 107 questionnaires were completed. Characteristics of participants are listed in Table 1. The majority of respondents were female (81.3%). Most of the respondents were nurses (42.1%) and married (68.1%).

#### *Factors affecting food purchase preferences and attitudes towards foods*

The factors influencing the choice of food shopping of all the participants has emerged that features that are associated with the quality of the food (appearance/freshness and quality) (Table 2). It's find out that purchasing non-allergic foods (97.2%), flavour (95.3%) and preferences of family members (92.5%) were also important factors among the participants. European Food Safety Authority (EFSA)'s study was conducted among the citizens of the European Union (EU), the vast majority of the EU citizens say that quality (96%) and price (91%) are important to them when buying food (7). Similar to our study, Turkish Food Safety Associations' research shows that 89.0% of Turkish citizens think that family members' preferences has essential impact on food purchase preferences (18).

It has figured out that marital status and gender are important factors that affect food buying decisions. It was discovered that married participants paying more attention to whether or not a food product is allergic than unmarried participants ( $p < 0.05$ ). Price, appearance/freshness, fitness for use and brand affect women's preferences much more than men ( $p < 0.05$ ). Consumer attitudes towards food safety can vary according to the subject of the individuals' food safety concern. Brewer et al. (3); indicated that there are several factors effective on consumers' trust on foods. These are chemical problems such as hormones and food additives; health problems such as cholesterol content of foods and nutritional value; problems with the deterioration of the food (i.e. microbial contamination that could be caused); various legal issues such as food inspection, labeling, fraud and deception in food and failure to provide appropriate conditions for the production (i.e. an appropriate amount of pesticide use).

Various questions were asked with the purpose of acquiring knowledge of the issues that participants are concerned about food. Hence the behavior of the participants' food purchase is found out (Table 3). According to the data obtained, almost all the individuals who participated in the study are concerned about fraud and deception that may exist in foods and the unsanitary production conditions (95.3%). The second major issue that participants concerned about food was pesticide residues in fruits, vegetables and cereals (86.9%). Similar findings have also been reported by the Turkish Food Safety Association. The results showed that 80% of Turkish consumers also are worried about pesticide residues in foods (18). Similarly, according to the consumer survey conducted in the EU, it's figured out that the most concerned subject about food was pesticide residues among European citizens (72%) (7).

It's identified in the study that there are several differences in male and female participants. Unhygienic conditions during food preparation outside the home is much more worrisome for women participants than men (women 88%, men 12%). Based on some other researches, consumer attitudes towards food safety vary according to sociodemographic characteristics such as gender, age and education. A survey conducted in the United States demonstrated that men have more risky behaviour than women about food safety (1).

**Table 1: Demographical characteristics of participants**

Demographic characteristics	Variables	n	%
Gender	Female	87	81.3
	Male	20	18.7
Age	≤19	0	.0
	20-29	22	20.6
	30-39	40	37.4
	40-49	25	23.4
	50-59	20	18.7
	≥60	0	.0
Education	High School	4	3.7
	University	83	77.6
	Higher Education	20	18.7
Marital status	Single	34	31.8
	Married	73	68.2
Profession	Doctor	33	30.8
	Nurse	45	42.1
	Midwife	29	27.1

**Table 2: Factors that affecting choice of food shopping**

Variables	Important		Gender	Marital status
	n	%	p	p
Preferences of family	99	92.5	0.190	0.604
Non-allergic	104	97.2	0.187	<b>0.001</b>
Habit	72	67.3	0.223	<b>0.016</b>
Price	83	77.6	<b>0.006</b>	0.909
Appearance/freshness	107	100.0	<b>0.011</b>	0.082
Quality	107	100.0	0.568	0.182
Fitness for use	92	86.0	<b>0.041</b>	0.360
Flavor	102	95.3	0.061	<b>0.020</b>
Brand	80	74.8	<b>0.005</b>	<b>0.003</b>
Origin	78	72.9	0.295	0.093
Production techniques (organic, traditional, environmentally friendly etc.)	90	84.1	0.064	<b>0.010</b>
New product	49	45.8	0.186	<b>0.000</b>

\* Participants responded to more than one option.

**Table 3: Worrisome subjects about food consumption**

Variables	Very worrisome		Partly worrisome		Not worrisome	
	n	%	n	%	n	%
Genetically Modified Organisms in foods (GMOs)	71	66.4	36	33.6	0	.0
<b>Weight gain</b>	<b>57</b>	<b>53.3</b>	<b>40</b>	<b>37.4</b>	<b>10</b>	<b>9.3</b>
Allergic reactions due to food and drinks	85	79.4	22	20.6	0	.0
The additives such as preservatives, flavoring, colorants used in food and drink,	81	75.7	19	17.8	7	6.5
<i>Salmonella</i> contamination from egg, <i>Listeria</i> contamination from cheese	86	80.4	15	14.0	6	5.6
Harmful chemicals in foods occurs during cooking, baking, grilling	71	66.4	33	30.8	3	2.8
Environmental pollutants such as mercury and dioxins	87	81.3	14	13.1	6	5.6
Hormone and antibiotic residues left in meat	88	82.2	19	17.8	0	.0
Pesticide residues in fruit, vegetables and cereals	93	86.9	14	13.1	0	.0
<b>Unhygienic conditions during the food preparation outside the home</b>	<b>92</b>	<b>86.0</b>	<b>12</b>	<b>11.2</b>	<b>3</b>	<b>2.8</b>
<b>Growing conditions of livestock</b>	<b>65</b>	<b>60.7</b>	<b>28</b>	<b>26.2</b>	<b>14</b>	<b>13.1</b>
Various tricks and deception	102	95.3	5	4.7	0	.0
Unsanitary production conditions	102	95.3	5	4.7	0	.0

**Table 4: Purchasing behavior and food safety knowledge**

Variables	Disagree		Partially agree		Agree		Gender	Profession
	N	%	n	%	n	%	p	p
It is easy to find high quality and safe food products	14	13.1	78	72.9	15	14.0	0.039	0.052
I follow the instructions on packing while storing or cooking foods	0	0	30	28.0	77	72.0	0.187	0.003
I'm willing to pay more money for hormone-free food products	28	26.2	23	21.5	56	52.3	0.000	0.000
I care about the nutrition value of a food rather than its taste	0	0	62	57.9	45	42.1	0.001	0.043
<b>I prefer additive-free food products</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>10.3</b>	<b>96</b>	<b>89.7</b>	<b>0.000</b>	<b>0.000</b>
If a food product that i purchased is damaged, i return it to the store	0	0	11	10.3	96	89.7	0.389	0.002
<b>Terms of where food products are sold (cleanliness, hygiene, humidity) are very important</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>5.6</b>	<b>101</b>	<b>94.4</b>	<b>0.000</b>	<b>0.014</b>
I carefully check the package whether it is damaged or not	0	0	4	3.7	103	96.3	0.742	0.566
Price of the food product is a factor that affects my purchasing decision	17	15.9	61	57.0	29	27.1	0.162	0.055
I pay attention to prepare healthy meals	2	1.9	44	41.1	61	57.0	0.020	0.043
Branded products are always of high quality and reliable	15	14.0	75	70.1	17	15.9	0.000	0.001
Good nutritional value foods are more expensive	14	13.1	82	76.6	11	10.3	0.074	0.148
I know the protein, vitamin etc. content of foods and I choose products according to that	3	2.8	54	50.5	50	46.7	0.134	0.184
I read the information on the label of food products I purchased	0	0	32	29.9	75	70.1	0.030	0.209
Quality food products are sold in major supermarkets and shopping centers	41	38.3	63	58.9	3	2.8	0.438	0.002
<b>I pay attention to expiration dates when buying food</b>	<b>1</b>	<b>9</b>	<b>14</b>	<b>13.1</b>	<b>92</b>	<b>86.0</b>	<b>0.005</b>	<b>0.012</b>
Information on the internet is a factor that affects my food purchasing decision	35	32.7	53	49.5	19	17.8	0.039	0.005
The discount, the promotion etc. is a factor that affects my food purchasing decision	21	19.6	74	69.2	12	11.2	0.141	0.01
Ads gives you the necessary information about the product	38	35.5	69	64.5	0	0	0.326	0.058
I would like to have more information about nutrition on the packaging of food products	4	3.7	27	25.2	76	71.0	0.000	0.000
All bacteria in foods are harmful	29	27.1	48	44.9	30	28.0	0.002	0.002

Creams containing raw eggs, such as pastry products are risky foods	4	3.7	18	16.8	85	79.4	0.000	0.004
<b>E-numbers are listed on food labels refers to harmful substances</b>	<b>12</b>	<b>11.2</b>	<b>48</b>	<b>44.9</b>	<b>47</b>	<b>43.9</b>	<b>0.000</b>	<b>0.000</b>
Pasteurized milk in unopened packages can store in the refrigerator up to 3 days	29	27.1	17	15.9	61	57.0	0.005	0.000
It should not be consumed when there is swelling/cambering on a can	10	9.3	4	3.7	93	86.9	0.730	0.065

**Table 5: Consumers' opinion concerning responsibility for food safety**

Variables	n	%
Manufacturer	76	71.0
Municipality	24	22.4
Turkish Ministry of Food, Agriculture and Livestock	84	78.5
Civil Society Organizations	5	4.7
Turkish Public Health Directorate	36	33.6
Turkish Ministry of Health	45	42.1
Turkish Standards Institute	19	17.8
No idea	0	.0

\* Participants responded to more than one option.

**Table 6: Food-borne health problems that may occur**

Variables	n	%	Profession p
Allergies/Specific Food Allergies	98	91.6	0.844
Problems due to bacteria and hormones	67	62.6	0.000
Diabetes	58	54.2	0.189
Food poisoning	80	74.8	0.006
Digestive problems	65	60.7	0.078
Cardiovascular diseases /Circulatory problems	39	36.4	0.009
Cancer	46	43.0	0.362
Obesity / Over Weight	54	50.5	0.247
No problem or risk	7	6.5	0.005

\* Participants responded to more than one option.

**Table 7: Risk groups for food-borne illnesses**

Variables	n	%	Profession p
Babies	81	75.7	0.000
Children	61	57.0	0.004
Adults	16	15.0	0.091
Pregnants	73	68.2	0.078
Elders	56	52.3	0.378
Everyone is equal	47	43.9	0.000

\* Participants responded to more than one option.



**Table 8: Factors that may cause food poisoning**

Variables	n	%
Uncleaned kitchen ware	71	66.4
Consuming foods after expiration date	107	100.0
Not to wash hands properly	67	62.6
Using same equipment for both raw and cooked foods	65	60.7
Awaiting leftovers at room temperature	88	82.2
Improperly cooked foods	80	74.8

\* Participants responded to more than one option.

**Table 9: Respondents' food handling practices at home**

Query	Response	n	%
Do you know the temperature of your refrigerator and deep-freezer?	Yes	74	69.2
	No	33	30.8
What do you do with leftovers from your meal?	I leave them on the stove until they are eaten	3	2.8
	I store them in the refrigerator while still warm	1	.9
	I cool leftovers to room temperature and then put them in the refrigerator	102	95.3
	I freeze them	0	.0
	I throw them out	0	.0
	I use them to feed animals	1	.9
How do you re-heat leftovers from your meal?	In a microwave	27	25.2
	In an oven	3	2.8
	In a frying pan, wok or saucepan	77	72.0
	I do not re-heat them	0	.0
How long are you re-heating a meal?	I do not re-heat it	6	5.6
	For as long as it takes to become warm and ready for consumption	79	73.8
	Until it boils	22	20.6
Do you wash your hands before food preparation?	It is not necessary to do so	0	.0
	Depends on what I was previously doing	8	7.5
	Depends on the food I am going to prepare	4	3.7
	I always wash my hands	95	88.8
How do you dry your hands after washing?	I do not dry my hands	3	2.8
	With an apron	0	.0
	With a kitchen cloth used for wiping the dishes	3	2.8
	With a disposable paper kitchen towel	70	65.4
	With a kitchen cloth, intended for drying hands	31	29.0
How often do you clean your kitchen sink and kitchen counter?	After every use	89	83.2
	After every meal	12	11.2
	Once a day	5	4.7
	When they are dirty	1	.9
How do you store raw meat at home after purchase?	I do not preserve raw meat because I use it at once	30	28.0
	I refrigerate raw meat intended for immediate use, and freeze the rest	77	72.0

How do you defrost meat?	On a kitchen counter	25	23.4
	In a refrigerator	77	72.0
	In hot water	0	.0
	In a microwave	5	4.7
	I do not defrost, I start to cook meat while it is still frozen	0	.0
How do you wash your hands after handling raw meat?	I do not wash my hands, I dry them with a paper towel	0	.0
	I do not wash my hands, I dry them with a kitchen cloth	0	.0
	With cold or hot water	10	9.3
	With warm water and soap (or detergent)	97	90.7
	I do not wash my hands during food preparation	0	.0
What do you usually do when cutting raw meat and later use the same knife for cutting food not intended for cooking?	I use the same knife	0	.0
	I wipe the knife with a damp cloth	0	.0
	I wash the knife with cold water without a detergent	9	8.4
	I wash the knife with hot water without a detergent	14	13.1
	I wash the knife with hot water and a detergent	51	47.7
If you use the same knife for cutting raw and then cooked meat, there is a...	I use another knife	33	30.8
	... strong possibility for food poisoning	38	35.5
	... slight possibility for food poisoning	48	44.9
	This does not affect the potential for food poisoning	21	19.6

## *Purchasing Behaviour and Food Safety Knowledge of the Participants*

While purchasing, 96.3% of respondents indicated that they carefully check the package whether it is damaged or not. This is a higher proportion than that was found in the studies of Ergönül (6) and İncel (13); in which respectively 69% and 72% of respondents checked the package whether it is damaged or not.

When we evaluated the purchasing behaviour data with the participants' mostly worrisome subject (various tricks and deception), it was determined that there is a statistically significant relationship ( $p < 0.05$ ). According to these results, we can assume that participants think they can only get information on labelling of food products because of their concern about the presence of legal challenges.

Raw eggs which are used in some food products could be a very important food safety issue due to presence of *Salmonella* (6). Therefore, in order to reduce risk of food-borne illnesses, consumers should pay attention to raw eggs and products containing raw eggs. 80.4% of individuals who participated in our study were very concerned about contamination of *Salmonella* from eggs and *Listeria*

from cheese. According to the purchasing behavior of the participants, products which contain raw eggs such as creams, cakes etc. are risky foods for health (79.4%). According to these data, it can be concluded that the issues which the participants are concerned about, may affect the purchasing behavior. 89.7% of the participants stated that they will not prefer to additive usage in food products (Table 4). However, 11.2% of them are aware of the fact that E-numbers don't indicate harmful substances. According to the data obtained in the study, 78.5% of the participants are aware that "Turkish Ministry of Food, Agriculture and Livestock" is the first place to inform in case they encounter a food-related problem (Table 5), then food manufacturers (71%) and "Turkish Ministry of Health" (42.1%). In the survey of Turkish Food Safety Organization, consumers stated that they would inform the manufacturer first, then "Turkish Ministry of Health" and "Turkish Ministry of Food, Agriculture and Livestock" (18). These results indicate that Turkish consumers trust the food manufacturers. Therefore it can be concluded that consumers expect manufacturers to solve problems.

## *Food-borne illness knowledge of the participants*



According to our results, the 91.6% of health workers think that the main health problem that can occur because of food is food allergies. In this study, it is found that food poisoning is the second considered health problem about foods among participants (74.8%) (Table 6). It's interesting to see that the participants did not give food poisoning in their first responses. When we evaluated the results according to profession, the proportion of doctor respondents who believe that the food poisoning is a food-borne illness, is statistically significantly different from nurses and midwives who think the same way ( $\chi^2$ : 10,268). (Doctors 93.9%, nurses 62.2% and midwives 72.4%).

Respondents were asked who were the risk groups for food-borne illnesses in public. 75.7% of the individuals responded "babies". However, the proportion of individuals who responded "everyone is under equal risk" should be taken into account (43.9%) (Table 7). Food-borne illnesses can cause problems in all individuals but babies, little children, pregnant, elders and individuals with weakened immune systems (people suffer from HIV/AIDS, cancer, diabetes, kidney diseases or patients waiting for organ transplants) are at greater risk (19, 20). According to all participants in our study, consumption of expired foods is one of the factors that may cause food poisoning (Table 8). Yet as shown on the Table 4, most respondents stated that they pay attention to expiration date (86%), which can be compared to the study of Güneş et al. (9); in which it was estimated that 84% of consumers pay the most attention to expiration date on label. Our result for purchasing behavior is higher than that recorded by the study of Turkish Food Safety Organization, in which 53% of Turkish consumers stated that they pay attention to expiration date when purchasing food (18).

According to participants, leaving food in room temperature for a long time is the second important factor that may cause food poisoning (82.2%). Use of the same utensils for both raw and cooked foods was ranked last among the factors (60.7%).

#### *Participants' food handling practices at home*

We asked consumers if they knew the temperature that their refrigerators are set at to establish whether they find the storage conditions important or not. Almost thirty-eight percent of respondents did not know the temperature their refrigerators are set at (Table 9). Redmond and Griffith (17) remarked that a large proportion of consumers lack knowledge

of adequate refrigeration temperatures: 46–60% of US consumers and 50–93% of UK consumers do not know the optimum refrigeration temperature. Preserving foods in appropriate conditions is vital to prevent pathogenic microorganisms from reaching dangerous levels for health (21). To prevent the deterioration of the food, the refrigerator temperature must be at  $-4 \pm 1$  °C as  $5-6$  °C and higher temperatures are suitable for microbial growth. 73.8% of the participants stated that they re-heat the leftovers of the previous day until they are warm and ready for consumption. As implied in the publication of WHO "5 keys to Food Safety", it is very important to cook food until it reaches a proper internal temperature to prevent microbial risks in food (23). The proper temperature that WHO pointed is minimum 70 °C. We can estimate that re-heating food for as long as it takes to become warm and ready for consumption means that food will not reach the safe temperatures. Our survey demonstrated that a significant percentage of respondents re-heat food in a potentially unsafe manner, and it is for this reason that increased awareness is needed of the risks associated with these practices.

Thawing of the foods is an important process when the term «food safety» is taken into account. Incorrect thawing of high-risk foods will enable the growth of harmful microorganisms. It is known that safety risk increases if the foods involved are not processed in some way such as by cooking but rather are consumed as a ready to eat items (6). It is advised that frozen foods should be thawed in refrigerator or in microwave oven. We asked the participants about their opinions on thawing frozen meat. 72% of the participants declared that they were thawing foods in refrigerator conditions. On the other hand, substantial number of the participants (23.4%) expressed that they put frozen meat on the kitchen counter for thawing. The healthworkers participated in the study have unexpectedly limited knowledge on safety food handling methods. Besides that, ratio of the consumers using microwave oven at their home is only 4.7%. According to National Restaurant Association in USA, foods should be thawed in microwave oven or in refrigerators (6).

We investigated whether respondents thought that some food handling practices could lead to cross-contamination or not. We asked to participants that "What do you usually do when cutting raw meat and later use the same knife for cutting food not intended for cooking?" Most of respondents answered correctly "with hot water and a detergent" (47.7%)

and “use another knife” (30.8%). Hillers et al. (10) suggested that knives, cutting boards and food preparation surfaces should be washed with hot water and soap after contact with raw poultry, meat and seafood. They summarized behaviour related to cross-contamination as the second most important behaviour leading to outbreaks of *Campylobacter jejuni*, *Salmonella* serotypes other than Enteritidis, and *Yersinia enterocolitica*. According to the results we can say that cross-contamination is not a potential risky behaviour among healthcare workers. Less than half of the respondents (35.5%) believe there is a strong possibility of poisoning when using the same knife for cutting cooked and raw meat, 44.9% believe that the possibility is slight, and 19.6% believe that this does not affect potential poisoning. Those respondents who believe that there is a high possibility of poisoning when using the same knife for cutting cooked and raw meat are less likely to use the same knife, wipe it with a damp cloth or wash it with hot water without a detergent, and more likely to wash the knife with hot water and a detergent or use another knife (CC: 0,438;  $\chi^2$ : 25,402;  $p < 0.05$ ). Similar findings have also been reported by Jevsnič et al (14); 42.3% of the Slovenian consumers believe there is a strong possibility of poisoning when using the same knife for cutting cooked and raw meat and 17.8% believe that this does not affect potential poisoning. But when we keep in view that our study has been carried out with healthcare workers, we can say that presence of food poisoning risk should be considered at higher ratios.

## CONCLUSION

The food is a source of health and life of all mankind. In order to raise the public awareness and to protect public health, educational material about good housekeeping practice should be available to the general public from many sources that include primary healthcare services. Doctors' or experts' advices are more trusted by the consumers than other sources (i.e. internet, TV), hence, can be used more effectively in educating consumers (2,6). Especially primary healthcare service professionals should play an important role on training consumers about food safety and safe food handling practices in public because of their close contact with the community. This study highlighted some gaps in food safety knowledge and practices that occur from shopping to eating among healthcare professionals. By educating professionals properly, more effective training programmes for public could be created.

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HALIÇ ÜNİVERSİTESİ  
GİRİŞİMSSEL OLMAYAN KLİNİK ARAŞTIRMALAR ETİK KURULU

SAYI : 40  
KONU:

13 10 3 /2015

Sayın; Prof.Dr.Bedia AYHAN ÖZYILDIRIM

Haliç Üniversitesi Etik Değerlendirme Kurulunca yapmış olduğunuz başvuru incelenmiş olup, danışmanı olduğunuz İrem ÖZAY'ın "Sağlık Çalışanlarında Gıda Güvenliğine İlişkin Bilgi Düzeylerinin Saptanması" isimli araştırması kurulumuzun 16.02.2015 tarihli toplantısında etik yönden uygun olduğuna karar verilmiştir.

Bilgilerinize arz ederim.



Prof.Dr.Önder ÖZKAZANÇ  
Etik Kurul Başkanı



T.C.  
**HALIÇ ÜNİVERSİTESİ**  
**GİRİŞİMSSEL OLMAYAN KLİNİK ARAŞTIRMALAR ETİK KURUL KARARLARI**

<b>Tarih: 16.02.2015</b> <b>Toplantı Sayısı: 02</b>	<b>Karar No :12</b>				
	Prof.Dr.Bedia AYHAN ÖZYILDIRIM'ın yardımcı araştırmacı İrem ÖZAY ile araştırmayı planladığı "Sağlık Çalışanlarında Gıda Güvenliğine İlişkin Bilgi Düzeylerinin Saptanması" konulu çalışması incelendi, yapılan inceleme sonucunda araştırmanın etik yönden uygun olduğuna karar verildi.				
<b>ÜYELER</b>					
<b>Adı-Soyadı</b>	<b>Alanı</b>	<b>Kurumu</b>	<b>Araştırma ile ilişkisi</b>	<b>Katılım</b>	<b>İmza</b>
Prof.Dr.Önder ÖZKAZANÇ (Başkan)	İktisat	Haliç Üniversitesi İşletme Fakültesi	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>B.Özkazanç</i>
Doç.Dr.Leman ŞENTURAN (Raportör)	Hemşirelik	Haliç Üniversitesi Hemşirelik Yüksekokulu	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>L.Şenturan</i>
Prof.Dr.Güneş YAVUZER	Fizyoterapi ve Reh.	Haliç Üniversitesi Yüksekokulu	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>G.Yavuzer</i>
Prof.Dr.Filiz AÇKURT	Beslenme ve Diyetetik	Haliç Üniversitesi Yüksekokulu	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>F.Açkurt</i>
Prof.Dr.Oya OĞUZ	Fizik	Haliç Üniversitesi Fen Edebiyat Fakültesi	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>O.Öğuz</i>
Yrd.Doç.Dr.İlhan ODABAŞ	Spor Yöneticiliği	Haliç Üniversitesi Beden Eğt. ve Spor Yük. Okulu	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>I.Ödabaş</i>
Yrd.Doç.Dr.Pervin Sevda BIKMAZ	Psikoloji	Haliç Üniversitesi Fen Edebiyat Fakültesi	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>P.Bikmaz</i>
Yrd.Doç.Dr.Baki YÖKEŞ	Moleküler Biyoloji	Haliç Üniversitesi Fen-Edebiyat Fakültesi	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>B.Yökeş</i>
Av.Korkut HAZİNEDAR	Hukuk	Haliç Üniversitesi	<u>yok</u>	<input type="checkbox"/> <input type="checkbox"/>	<i>K.Hazinedar</i>